

Docket No.: 12810-00322-US1  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of:

Tim Jungkamp et al.

Application No.: 10/586,452

Confirmation No.: 4478

Filed: July 18, 2006

Art Unit: 1626

For: METHOD FOR THE SEPARATION OF  
PENTENENITRILE ISOMERS

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Examiner: Kosack, Joseph R.

**RESPONSE TO NON-FINAL OFFICE ACTION**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Madam:

**INTRODUCTORY COMMENTS**

In response to the Non-Final Office Action dated March 18, 2009, Applicants request reconsideration of the above-identified application in view of the following remarks:

**Remarks/Arguments** begin on page 2 of this paper.

**REMARKS/ARGUMENTS**

Claims 1-10 are currently pending in the application. No claims have been amended with the filing of this response.

Reconsideration of the pending claims of the present application is requested in view of the following remarks.

**Rejections under 35 U.S.C. § 103**

The rejection of claims 1-10 under 35 U.S.C. § 103(a) as obvious over Drinkard et al. (US Patent No. 3,356,748) in view of Fischer et al. (US Patent No. 6,242,633) and Jungkamp et al. (WO 02/26698) is respectfully traversed.

The references, alone or in combination, do not describe or suggest the claimed process of for producing 3-pentene nitrile.

In the present Office Action, the Office acknowledges and appreciates several deficiencies with Drinkard et al. and Jungkamp et al. For instance, the Office points out that Jungkamp et al. does not describe the exact pairs of isomers described in present claim 1 or any reactions of these mixtures. However, the Office asserts that the azeotropic distillation process Jungkamp et al. can be applied to other mixtures of pentenenitrile isomers, and that distillation techniques are generally used for purifying isomeric liquids.

In response, Applicants point out that the present application relates to a process for producing 3-pentene nitrile characterized by the following:

- (a) isomerization of an educt stream which contains 2methyl-3 butene nitrile, with at least one dissolved or dispersed isomerisation catalyst, so as to produce a stream 1 which contains at least one isomerization catalyst 2methyl-3 butene nitrile, 3-pentene nitrile and (Z)-2-methyl-2-butene nitrile;
- (b) distillation of stream 1, so as to yield a stream 2 as a head product which contains 2-methyl-3 butene nitrile, 3-pentene nitrile and (Z)-2-methyl-2-butene nitrile, and a stream 3 as a bottom product which contains at least one isomerization catalyst;

- (c) distillation of stream 2, so as to yield a stream 4 as a head product which, in comparison with stream 2 is richer in (Z)-2-methyl-2-butene nitrile, relative to the sum of all pentene nitriles in stream 2, and stream 5 as a bottom product which, in comparison to stream 2, is richer in 3-pentene nitrile and 2-methyl-3-butene nitrile, relative to the sum of all pentene nitriles in stream 2; and
- (d) distillation of stream 5, so as to yield as stream 6 a bottom product which contains 3-pentene nitrile, and as stream 7 a head product which contains 2-methyl-3-butene nitrile, the (Z)-2-methyl-2-butene nitrile depleted 2-methyl-3-butene nitrile being recycled.

In particular, the technical problem addressed in the present application is that of providing another process for producing 3-pentene nitrile. The solution is presented in claim 1 and related to the distillative separation steps (c) and (d), as well as to the recycling of the (Z)-2-methyl-2-butene nitrile depleted 2-methyl-3-butene nitrile.

By contrast, Drinkard et al. describes the isomerization of 2-methyl-3-butene nitrile with a  $\text{Ni}(0) [\text{P}(\text{OC}_2\text{H}_5)_3]_4$  catalyst, so as to yield a liquid product stream which is then vacuum-distilled. The distillate includes 2-methyl-3-butene nitrile, 3-pentene nitrile, 2-methyl-2-butene nitrile and 4-pentene nitrile. The bottom stream composition is not further described, but one would expect it to contain the catalytic system and possible solvents.

As such, the subject matter of present claim 1 clearly differs from Drinkard et al., i.e., by the above-recited distillation steps (c) and (d). This presently claimed combination of features is neither known nor can be directly derived from Drinkard et al., either alone or in combination with Fischer et al. and Jungkamp et al. In particular, the Office has not shown that there would be an apparent reason to modify Drinkard et al. with Jungkamp et al. or any other reference.

Applicants also point out that the unexpected success/results of the claimed inventions, as shown in the examples in the specification. For instance, the claimed process provides low losses of 2-methyl-3-butene nitrile during distillative separation of (Z)-2-methyl-2-butene nitrile (cf. example 1-4 of the present specification), since the boiling points of both compounds are only slightly different.

Accordingly, the claimed invention is novel and non-obvious over the cited references of record. Withdrawal of the rejections is respectfully requested.

In view of the foregoing, consideration and allowance of the present application are respectfully solicited.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 12810-00322-US1 from which the undersigned is authorized to draw.

Dated: June 1, 2009

Respectfully submitted,

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**LETTER REGARDING DOCUMENT INADVERTENTLY SUBMITTED**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Madam:

Please be advised that the attached document was filed inadvertently under Application No. 10/586,452 on June 1, 2009.

Accordingly, Applicant request that this filing be withdrawn from record.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 12810-00323-US from which the undersigned is authorized to draw.

Dated: June 1, 2009

Respectfully submitted,

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